Title (en)

Optical pickup with diffractive element for aberration compensation

Title (de)

Optisches Abtastgerät mit diffraktivem Element zur Kompensation von Aberrationen

Title (fr)

Tête de lecture optique comportant un élément diffractif pour la compensation d'aberrations

Publication

EP 1347447 A1 20030924 (EN)

Application

EP 03006124 A 20030318

Priority

JP 2002074686 A 20020318

Abstract (en)

Disclosed is such an optical pickup controlling an aberration even if optical axes of an objective lens and another optical system are shifted from each other. The optical pickup is a device for recording or reproducing an information signal by irradiating light along a track of a rotating optical disk, including a light source, a beam expander for changing a parallelism of light emitted from the light source, and an objective lens 33 for collecting the light emitted from the beam expander along the track of the optical disk and for irradiating the collected light thereonto, wherein the beam expander is comprised of a concave lens 31 and a Fresnel lens 32, and a focal distance fn of the diffraction lens exists in a range satisfying the following inequality: <DF>f1 < fn < f2, </DF> where <DF>f1 = ((lambda 2/ lambda 1)-1)f0 nu 0 </DF> <DF>f2 = (1-(lambda 2/ lambda 1))b </DF> <DF>b = -f0(f0+ DELTA)/ DELTA </DF> lambda 1 and lambda 2 are a designed lower limit wavelength and a designed upper limit wavelength, respectively, f0 and nu 0 are a focal distance and a partial dispersion of the objective lens, respectively, and DELTA is a difference between focal distances corresponding to the wavelengths lambda 1 and lambda 2. <IMAGE>

IPC 1-7

G11B 7/135; G02B 27/00

IPC 8 full level

G02B 5/18 (2006.01); **G02B 13/00** (2006.01); **G02B 13/18** (2006.01); **G11B 7/135** (2006.01); **G11B 7/1353** (2012.01); **G11B 7/1378** (2012.01); **G11B 7/1392** (2012.01); **G11B 7/1398** (2012.01); G11B 7/1372 (2012.01)

CPC (source: EP US)

G11B 7/1353 (2013.01 - EP US); **G11B 7/1378** (2013.01 - EP US); **G11B 7/13922** (2013.01 - EP US); **G11B 7/1398** (2013.01 - EP US); G11B 2007/13722 (2013.01 - EP US)

Citation (search report)

- [X] EP 1154417 A2 20011114 - KONISHIROKU PHOTO IND [JP]
- [PX] EP 1276104 A2 20030115 - KONISHIROKU PHOTO IND [JP]
- [A] US 6101035 A 20000808 - MARUYAMA KOICHI [JP]
- [A] US 5969862 A 19991019 - MARUYAMA KOICHI [JP]
- [PX] US 2002097504 A1 20020725 - KITAMURA KAZUYA [JP], et al

Citation (examination)

- EP 0819952 A2 19980121 - EASTMAN KODAK CO [US]
- WOOD A.P.: "DESIGN OF INFRARED HYBRID REFRACTIVE-DIFFRACTIVE LENSES", APPLIED OPTICS, OPTICAL SOCIETY OF AMERICA, vol. 31, no. 13, 1 May 1992 (1992-05-01), WASHINGTON, US, pages 2253 - 2258, XP001094874

Designated contracting state (EPC)

DE FR GB

DOCDB simple family (publication)

EP 1347447 A1 20030924; CN 1211791 C 20050720; CN 1445765 A 20031001; JP 2003270525 A 20030925; JP 3716805 B2 20051116; US 2003174632 A1 20030918; US 7050378 B2 20060523

DOCDB simple family (application)

EP 03006124 A 20030318; CN 03120030 A 20030311; JP 2002074686 A 20020318; US 38641703 A 20030313